City of Seattle
Department of Design, Construction and Land Use
CLIENT ASSISTANCE MEMO

405

Energy-Efficient Lighting Equipment

April 1999

OVERVIEW

This information was prepared to provide design professionals with a guide to some energy-efficient lighting equipment. Attached are:

- Ballast List for One Lamp: pages 1 - 3
- Ballast List for Two Lamps: pages 4 - 9
- Ballast List for Three Lamps: pages 9 - 12
- Ballast List for Four Lamps: pages 12 - 15
- Ballast List for Lamps with Dimming Electronic Ballast: pages 15 - 16

These were developed by the Seattle Lighting Design Lab and are regularly updated by them.

There have been many recent advances in energy-efficient lighting technology and the market has continued to evolve and move forward. Lighting design for office space is changing as computers are used more widely. Parabolic diffusers offer efficient distribution of light to the space while minimizing glare on computer screens. T-8 lamps are now being widely used because they provide better color rendering and, due to their narrower diameter, deliver more light to the space and thus are also more energy efficient. These diffusers and lamps combined with efficient ballasts are resulting in a shift towards two-lamp fixtures instead of three-lamp fixtures. Compact fluorescent downlights are commonly accepted for corridor lighting. Make sure to choose ballasts with a high power factor and a low total harmonic distortion (THD). The attached lists provide further information on these issues.

In addition to design evolution, the 1992 National Energy Act specified minimum efficiency standards for lamps and ballasts that manufacturers must comply with. Thus, less-efficient equipment is no longer available. In response to greater market penetration of energy-efficient lighting technologies and to federal law, a revised Washington State Energy Code took effect in April 1994, with lighting power allowances roughly 10% lower than those in the 1991 Seattle Energy Code. These lighting power allowances remain unchanged in the 1997 Energy Code. To encourage use of the best technologies, since 1994 the Energy Code has also contained a true prescriptive option that allows unlimited wattage if certain fixtures, lamps and ballasts are installed. The 1997 Seattle Energy Code expands slightly the list of acceptable lamps.

INFORMATION TO BE INCLUDED ON PLANS

- Provide a lighting fixture schedule which has description of fixture (e.g. non-lensed), number of lamps/fixture (1,2,3), type of lamp (fluorescent, HID, tungsten halogen), watts/lamp including the ballast, and type of ballast (electronic).
- Indicate whether track lighting is low voltage or not.
- For all incandescent (unballasted) fixtures, provide the maximum UL listed wattage for that fixture (Energy Code compliance is based on fixture wattage, not lamp wattage, for unballasted fixtures).
- Identify all exempt lighting on drawing and on the lighting fixture schedule. Explain on the schedule and provide comments why the lighting is exempt (retail display, adjustable tungsten-halogen, food preparation lighting).
- Provide automatic lighting controls for office buildings over 5,000 square feet and all school classrooms per Energy Code Section 1513.6.
- Provide separate switching for all lighting in daylighting zones per Energy Code Section 1513.3.
- Provide lighting system commissioning per Seattle Energy Code Section 1513.7.

OTHER INFORMATION TO BE SUBMITTED

- Provide completed Lighting Summary Form.

FURTHER INFORMATION

For additional copies of this Client Assistance Memo (CAM) or revised versions of it, contact the Seattle Department of Design, Construction and Land Use (DCLU) at (206) 684-8850. All CAMs are public domain documents and may be freely copied without any special permission.

For projects within the Seattle city limits, further information on Seattle Energy Code requirements is available from the DCLU Technical Backup line at (206) 684-7846 from 1 p.m.-4:15 pm or visit the Energy Code website at www.ci.seattle.wa.us/dclu/energy.

For information on the electrical permit process, contact the DCLU Electrical Counter at (206) 684-8464 from 8 am-5 pm, except 10 am-5 pm on Tuesday. Note that the 1997 Washington State Energy Code Lighting Summary Form is required to be submitted with all applications.

The Seattle Lighting Design Lab is a nationally recognized facility which has displays of state of the art lighting equipment and is available to assist designers and contractors. For information on the Seattle Lighting Design Lab facilities (located at 400 East Pine Street in Seattle), tours, seminars and updated equipment lists, call (206) 325-9711.

(Sample)
LIGHTING FIXTURE SCHEDULE

Item No.	Fixture Mfr/Model	Fixture Description	Lamps/ fixture	Lamps Mfr./ Model	Lamp Description	Watts/ lamp	Ballast Type	Rated Watts/ fixture[2]	Comments
1	Mfr-A/M201	2' x 4' non-lensed	2	ZZ1/32	Fluorescent T-8	32	Electronic	60	
2	Mfr-B/M202	Down light	1	ZZ1/45	Incandescent	60	None	75	UL rating 75W/fixture
3	Mfr-C/M203	8' track, low voltage	3	ZZ1/81	Tungsten-Halogen	50	None	200	24 volt @ 25W/foot
4	Mfr-D/M204	Adjustable flood	1	ZZ1/43	HID	70	Efficient Magnetic	90	Exempt per note #1 below

Notes:
1. Retail merchandise display per Energy Code Table 15-1 footnote No. 10
2. This column contains the maximum rates watts per fixture or track in accordance with the Washington State Energy Code, Section 1530.

1997 Washington State Nonresidential Energy Code Compliance Form

Lighting Summary — LTG-SUM

1997 Washington State Nonresidential Energy Code Compliance Forms — First Edition - June, 1998

Project Info	Project Address	Date
		For Building Department Use
	Applicant Name:	
	Applicant Address:	
	Applicant Phone:	

Project Description ☐ New Building ☐ Addition ☐ Alteration

Compliance Option ○ Prescriptive ○ Lighting Power Allowance ○ Systems Analysis
(See Qualification Checklist (over). Indicate Prescriptive & LPA spaces clearly on plans.)

Alteration Exceptions (check appropriate box)
☐ No changes are being made to the lighting
☐ Less than 60% of the fixtures are new, and installed lighting wattage is not being increased

Maximum Allowed Lighting Wattage (Interior)

Location (floor/room no.)	Occupancy Description	Allowed Watts per ft² **	Area in ft²	Allowed x Area
** From Table 15-1 (over) - document all exceptions on form LTG-LPA			Total Allowed Watts	

Proposed Lighting Wattage (Interior) (May not exceed Total Allowed Watts for Interior)

Location (floor/room no.)	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
Total Proposed Watts may not exceed Total Allowed Watts for Interior			Total Proposed Watts	

Maximum Allowed Lighting Wattage (Exterior)

Location	Description	Allowed Watts per ft² or per lf	Area in ft² (or lf for perimeter)	Allowed Watts x ft² (or x lf)
Covered Parking		0.2 W/ft²		
Open Parking		0.2 W/ft²		
Outdoor Areas		0.2 W/ft²		
Bldg. (by facade)		0.25 W/ft²		
Bldg. (by perim)		7.5 W/lf		
Note: for building exterior, choose either the facade area or the perimeter method, but not both)			Total Allowed Watts	

Proposed Lighting Wattage (Exterior) (May not exceed Total Allowed Watts for Exterior)

Location	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
Total Proposed Watts may not exceed Total Allowed Watts for Exterior			Total Proposed Watts	

AN ELECTRONIC VERSION OF THIS FORM IS AVAILABLE ON THE SEATTLE ENERGY CODE WEBSITE AT www.ci.seattle.wa.us/dclu/energy/formsnon.htm

***** Projects shall comply with lighting control requirements in Energy Code Section 1513.6, including Seattle amendments for automatic controls in office buildings over 5,000 square feet in Section 1513.6 and for lighting control commissioning in Section 1513.7. *****

1997 Washington State Nonresidential Energy Code Compliance Form

Lighting Summary (back) LTG-SUM

Prescriptive Spaces	Occupancy:	◯ Warehouses, storage areas or aircraft storage hangers ◯ Other
Qualification Checklist Note: If occupancy type is "Other" and fixture answer is checked, the number of fixtures in the space is not limited by Code. Clearly indicate these spaces on plans. If not qualified, do LPA Calculations.	Lighting Fixtures:	☐ Check here if at least 95% of fixtures in the space meet all four criteria: 1. Fixtures are fluorescent, non-lensed, with only one or two lamps, and 2. Lamps are T-5, T-6, T-8 or PL, and 3. Lamps are 5-50 Watts, and 4. Ballasts are electronic ballasts

Table 15-1 Unit Lighting Power Allowance (LPA) for Interior Lighting

Use[1]	LPA[2] (W/ft²)	Use[1]	LPA[2] (W/ft²)
Painting, welding, carpentry, machine shops	2.3	Police and fire stations[8]	1.2
Barber shops, beauty shops	2	Atria (atriums)	1
Hotel banquet/conference/exhibition hall[3,4]	2	Assembly spaces[4], auditoriums, gymnasia[9], theaters	1
Laboratories	2	Process plants	1
Aircraft repair hangars	1.5	Restaurants/bars[5]	1
Cafeterias, fast food establishments[5]	1.5	Retail A[10]	1
Factories, workshops, handling areas	1.5	Retail B[10], Retail banking	1.5
Gas stations, auto repair shops[6]	1.5	Locker and/or shower facilities	0.8
Institutions	1.5	Warehouses[11], storage areas	0.5
Libraries[2]	1.5	Aircraft storage hangars	0.4
Nursing homes	1.5	Parking garages	See Section 1512
Wholesale stores (pallet rack shelving)	1.5		
Mall concourses	1.4	**Plans Submitted for Common Areas Only[7]**	
Schools buildings, school classrooms, day care centers	1.35	Common area, corridors, lobbies (except mall concourse)	0.8
Laundries	1.3	Toilet facilities and washrooms	0.8
Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches)[3,7,11]	1.2		

Footnotes for Table 15-1

1. In cases in which a use is not mentioned specifically, the *Unit Power Allowance* shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
2. The watts per square foot may be increased, by two percent per foot of ceiling height above twenty feet, unless specifically directed otherwise by subsequent footnotes.
3. Watts per square foot of room may be increased by two percent per foot of ceiling height above twelve feet.
4. For all other spaces, such as seating and common areas, use the *Unit Light Power Allowance* for assembly.
5. Watts per square foot of room may be increased by two percent per foot of ceiling height above nine feet.
6. Includes pump area under canopy.
7. In cases in which a lighting plan is submitted for only a portion of a floor, a Unit Lighting Power Allowance of 1.35 may be used for usable office floor area and 0.80 watts per square foot shall be used for the common areas, which may include elevator space, lobby area and rest rooms. Common areas, as herein defined do not include mall concourses.
8. For the fire engine room, the Unit Lighting Power Allowance is 1.0 watts per square foot.
9. For indoor sport tournament courts with adjacent spectator seating, the Unit Lighting Power Allowance for the court area is 2.6 watts per square foot.
10. For both Retail A and Retail B, light for free-standing display, building showcase illumination and display window illumination installed within two feet of the window are exempt.

    Retail A allows a Unit Lighting Power Allowance of 1.0 watts per square foot. Ceiling mounted adjustable tungsten halogen and HID merchandise display illuminaries are exempt.

    Retail B allows a Unit Lighting Power Allowance of 1.5 watts per square foot, including all ceiling mounted merchandise display luminaries.
11. Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior Unit Lighting Power Allowance, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.

Electronic Ballast List for Full Size T8 Fluorescent Lamps

- *This is a list of the electronic ballasts that meet the Lighting Design Lab - Specification Committee's, Fluorescent Lamp Electronic Ballast Specifications, and ANSI C82.11-1993.*
- *For further information please call the lighting Design Lab at (206) 325-9711 or 1-800-354-3864.*
- *See page 16 for notes.*

	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	1 F17T8	Advance	RCN-1P32	120	19	1.08	No	IS	50
New>	1 F17T8	LG	LG132I120EN	120	17	0.88	No	IS	0
	1 F17T8	Motorola	M1-IN-T8-(D)-120	120	19	0.89	No	IS	0
	1 F17T8	Motorola	M1-IN-T8-GP-A-120	120	18	0.88	No	IS	0
	1 F17T8	Robertson	RER1LT8-120	120	19	1.03	No	RS	50
	1 F25T8	Advance	RCN-1P32	120	25	1.00	No	IS	50
	1 F25T8	Advance	REL-1S32-RH-TP	120	23	0.92	No	RS	50
	1 F25T8	Goldstar	GB-1X32/FL/I/120	120	27	0.92	No	IS	50
	1 F25T8	Kingtec	132K-120	120	26	0.96	No	RS	50
New>	1 F25T8	LG	LG132I120EN	120	23	0.87	No	IS	0
	1 F25T8	Magnetek/Triad	B232I120HP	120	28	1.01	No	IS	0
	1 F25T8	Magnetek/Triad	B232R120HP	120	29	1.03	No	Par-RS	50
	1 F25T8	Motorola	M1-IN-T8-(D)-120	120	26	0.87	No	IS	0
	1 F25T8	Motorola	M1-IN-T8-GP-A-120	120	24	0.86	No	IS	0
	1 F25T8	Robertson	RER1LT8-120	120	25	0.97	No	RS	50
	1 F32T8	Advance	RCN-1P32	120	31	0.94	Yes	IS	50
	1 F32T8	Advance	REL-1P32-RH-TP	120	31	0.91	Yes	IS	50
	1 F32T8	Advance	REL-1S32-RH-TP	120	30	0.88	No	RS	50
	1 F32T8	Advance	RIC-132-TP	120	30	0.85	No	RS	50
	1 F32T8	Advance	RIC-140-TP	120	40	1.13	No	RS	50
	1 F32T8	Aromat	E132I120H2	120	32	0.96	No	IS	50
	1 F32T8	ELI	ES-1-T8-32-RS-120-A	120	33	0.94	No	RS	50
	1 F32T8	Fulham	FEP-400-120	120	33	0.89	No		
	1 F32T8	Goldstar	GB-1X32/FL/I/120	120	33	0.91	No	IS	50
	1 F32T8	Goldstar	GB-2X32/FL/I/120	120	38	1.05	No	IS	50
	1 F32T8	Howard Industries	EC(W)1/32IS-120	120	28	0.87	No	IS	0
	1 F32T8	Howard Industries	EC1/32IS-120	120	28	0.87	No	IS	0
New>	1 F32T8	Howard Industries	ECL1/32IS-120	120	25	0.75*	No	IS	
New>	1 F32T8	Howard Industries	EH1/32IS-120	120	40	1.13	No	IS	
New>	1 F32T8	Howard Industries	EPC1/32IS-120	120	29	0.86	No	IS	
New>	1 F32T8	Howard Industries	EPC1/32IS-120	120	29	0.86	No	IS	
	1 F32T8	Kingtec	132K-120	120	33	0.92	No	RS	50
New>	1 F32T8	LG	LG132I120EN	120	30	0.88	No	IS	0
New>	1 F32T8	LG	LG232I120EN	120	36	1.02	No	IS	0
	1 F32T8	Magnetek/Triad	B232I120HP	120	36	0.99	Yes	IS	0
	1 F32T8	Magnetek/Triad	B232I120RH	120	36	1.01	Yes	IS	0
	1 F32T8	Magnetek/Triad	B232R120HP	120	38	0.99	Yes	Par-RS	50
	1 F32T8	Magnetek/Triad	B240I120HP	120	37	1.04	Yes	IS	0
	1 F32T8	Motorola	M1-IN-T8-(D)-120	120	33	0.89	No	IS	0
	1 F32T8	Motorola	M1-IN-T8-GP-A-120	120	31	0.86	No	IS	0
	1 F32T8	Motorola	M1-RL-T8-1LL-120	120	27	0.75*	No	RS	50
	1 F32T8	Motorola	M1-RN-T8-1LL-(D)-12	120	31	0.86	No	RS	50
	1 F32T8	Osram/Sylvania	QT-2x32/120IS	120	33	0.90	No	IS	0
	1 F32T8	Osram/Sylvania	QT-2x32/120LP	120	35	0.77*	No	IS	0
New>	1 F32T8	Philips	HFP-120-1/32 RS	120	32	0.85*	No	RS	
New>	1 F32T8	Philips	SSB2-120-1/32 IS LH	120	31	0.92	No	IS	50

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- *See page 16 for notes.*

	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	1 F32T8	Prescolite Controls	P120-13RS	120	33	0.88	No	RS	50
	1 F32T8	Robertson	RER1LT8-120	120	33	0.97	No	RS	50
New>	1 F32T8	Techmedia	132 T 120	120	31	0.85*	No	Par-RS	50
	1 F32T8	Toshiba	FMB32IS1-120	120	32	0.94	No	IS	50
	1 F32T8	Toshiba	FMB32RP1-120	120	32	0.78*	No	RS	50
New>	1 F32T8	Toshiba	T132120A	120	31	0.87	No	IS	50
	1 F40T8	Advance	RCN-1P32	120	36	0.90	No	IS	50
	1 F40T8	Goldstar	GB-1X32/FL/I/120	120	38	0.85	No	IS	50
New>	1 F40T8	LG	LG159I120EN	120	38	0.92	No	IS	0
	1 F40T8	Magnetek/Triad	B240I120HP	120	45	1.01	No	IS	50
New>	1 F59T8	Howard Industries	EC1/59IS-120	120	58	0.86	No	IS	
New>	1 F96T8	Advance	REL-2P59-S-RH-TP	120	69	1.06	No	IS	
New>	1 F96T8	LG	LG159I120EN	120	57	0.87	No	IS	0
	1 F96T8	Magnetek/Triad	B259I120HP	120	67	1.03	No	IS	50
	1 F96T8	Magnetek/Triad	B259I120HPL	120	58	0.88	No	IS	50
	1 FT39T5	Magnetek/Triad	B140R120HP	120	39	0.94	No	RS	50
	1 FT39T5	Magnetek/Triad	B240R120HP	120	46	1.03	No	Par-RS	50
	1 FT40T5	Advance	RIC-132-TP	120	36	0.84*	No	RS	50
	1 FT40T5	Goldstar	GB-1X32/FL/I/120	120	38	0.88	No	IS	50
	1 FT40T5	Magnetek/Triad	B240I120HP	120	42	0.98	Yes	IS	50
New>	1 FT40T5	Magnetek/Triad	C240I120RH	120	43	0.99	No	IS	50
	1 FT50T5	Advance	REL-1TT-S-50-RH-TP	120	55	1.01	No	RS	32
	1 F17T8	Advance	VCN-1P32	277	19	1.07	No	IS	50
New>	1 F17T8	LG	LG132I277EN	277	18	0.87	No	IS	0
	1 F17T8	Motorola	M1-IN-T8-(D)-277	277	20	0.90	No	IS	0
	1 F17T8	Motorola	M1-IN-T8-GP-A-277	277	19	0.87	No	IS	0
	1 F17T8	Motorola	M1-RN-T8-1LL-(D)-27	277	16	0.86	No	RS	50
	1 F25T8	Advance	VCN-1P32	277	25	0.98	No	IS	50
	1 F25T8	Advance	VEL-1S32-RH-TP	277	24	0.92	No	RS	50
	1 F25T8	Goldstar	GB-1X32/FL/I/277	277	27	0.94	No	IS	50
New>	1 F25T8	LG	LG132I277EN	277	24	0.86	No	IS	0
	1 F25T8	Magnetek/Triad	B232I277HP	277	28	1.00	No	IS	0
	1 F25T8	Magnetek/Triad	B232R277HP	277	30	1.03	No	Par-RS	50
	1 F25T8	Motorola	M1-IN-T8-(D)-277	277	27	0.91	No	IS	0
	1 F25T8	Motorola	M1-IN-T8-GP-A-277	277	26	0.86	No	IS	0
	1 F25T8	Motorola	M1-RN-T8-1LL-(D)-27	277	23	0.88	No	RS	50
	1 F32T8	Advance	VCN-1P32	277	30	0.92	Yes	IS	50
	1 F32T8	Advance	VDC-132-TP	277	33	0.85	No	RS	50
	1 F32T8	Advance	VEL-1P32-RH-TP	277	30	0.89	Yes	IS	50
	1 F32T8	Advance	VEL-1S32-RH-TP	277	30	0.88	No	RS	50
	1 F32T8	Advance	VIC-140-TP	277	39	1.09	No	RS	50
	1 F32T8	Aromat	E132I277H2	277	32	0.93	No	IS	50
	1 F32T8	ELI	ES-1-T8-32-RS-277-A	277	30	0.90	No	RS	50
	1 F32T8	Energy Savings Inc.	ES1T8-32RS277-AL1	277	30	0.90	No	RS	0
	1 F32T8	Fulham	FEP-400-277-132-LW	277	28	0.72*	No		

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- *For further information please call the lighting Design Lab at (206) 325-9711 or 1-800-354-3864.*
- *See page 16 for notes.*

	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	1 F32T8	Goldstar	GB-1X32/FL/I/277	277	34	0.93	No	IS	50
	1 F32T8	Goldstar	GB-2X32/FL/I/277	277	38	1.05	No	IS	50
	1 F32T8	Howard Industries	EC(W)1/32IS-277	277	29	0.88	No	IS	0
	1 F32T8	Howard Industries	EC1/32IS-277	277	29	0.87	No	IS	0
New>	1 F32T8	Howard Industries	ECL1/32IS-277	277	26	0.75*	No	IS	
New>	1 F32T8	Howard Industries	EH1/32IS-277	277	40	1.14	No	IS	
New>	1 F32T8	Howard Industries	EPC1/32IS-277	277	30	0.87	No	IS	
	1 F32T8	Kingtec	132K-277-IS	277	30	0.90	Yes	IS	50
New>	1 F32T8	LG	LG132I277EN	277	30	0.87	No	IS	0
New>	1 F32T8	LG	LG232I277EN	277	36	1.01	No	IS	0
	1 F32T8	Magnetek/Triad	B232I277HP	277	35	0.97	Yes	IS	0
	1 F32T8	Magnetek/Triad	B232I277RH	277	36	1.03	Yes	IS	0
	1 F32T8	Magnetek/Triad	B232R277HP	277	39	0.98	Yes	Par-RS	50
	1 F32T8	Magnetek/Triad	B240I277HP	277	37	1.02	Yes	IS	0
	1 F32T8	Motorola	M1-IN-T8-(D)-277	277	32	0.88	No	IS	0
	1 F32T8	Motorola	M1-IN-T8-GP-A-277	277	32	0.85	No	IS	0
	1 F32T8	Motorola	M1-RL-T8-1LL-277	277	27	0.79*	No	RS	50
	1 F32T8	Motorola	M1-RN-T8-1LL-(D)-27	277	32	0.95	No	RS	50
	1 F32T8	Osram/Sylvania	QT-1x32/277IS	277	33	0.95	No	IS	0
	1 F32T8	Osram/Sylvania	QT-2x32/277IS	277	35	1.02	No	IS	0
	1 F32T8	Philips	SSB2-277-1/32 IS LH	277	30	0.92	No	IS	32
	1 F32T8	Prescolite Controls	P277-13RS	277	32	0.87	No	RS	50
	1 F32T8	Robertson	RER132-277	277	34	0.99	No	RS	50
New>	1 F32T8	Techmedia	132 T 277	277	31	0.91	No	Par-RS	50
	1 F32T8	Toshiba	FMB32IS1-277	277	31	0.92	No	IS	50
	1 F32T8	Toshiba	FMB32RP1-277	277	32	0.82*	No	Par-RS	50
New>	1 F32T8	Toshiba	T132277A	277	33	0.92	No	IS	50
	1 F40T8	Advance	VCN-1P32	277	35	0.88	No	IS	50
	1 F40T8	Goldstar	GB-1X32/FL/I/277	277	39	0.88	No	IS	50
New>	1 F40T8	LG	LG159I277EN	277	39	0.92	No	IS	0
	1 F40T8	Magnetek/Triad	B240I277HP	277	44	0.99	No	IS	50
New>	1 F59T8	Howard Industries	EC1/59IS-277	277	58	0.87	No	IS	
New>	1 F96T8	Advance	VEL-2P59-S-RH-TP	277	70	1.13	No		
New>	1 F96T8	LG	LG159I277EN	277	57	0.86	No	IS	0
	1 F96T8	Magnetek/Triad	B259I277HP	277	65	1.02	No	IS	50
	1 F96T8	Magnetek/Triad	B259I277HPL	277	58	0.85	No	IS	50
	1 FT39T5	Magnetek/Triad	B140R277HP	277	38	0.94	No	RS	50
	1 FT39T5	Magnetek/Triad	B240R277HP	277	47	1.01	No	Par-RS	50
	1 FT40T5	Advance	VIC-132-TP	277	37	0.83*	No	RS	50
	1 FT40T5	Goldstar	GB-1X32/FL/I/277	277	39	0.90	No	IS	50
	1 FT40T5	Magnetek/Triad	B240I277HP	277	42	0.96	Yes	IS	50
New>	1 FT40T5	Magnetek/Triad	C240I277RH	277	42	0.98	No	IS	50
New>	1 F96T8	Techmedia	196 T 347 T8	347	57	0.88	No	IS	50

Electronic Ballast List for Full Size T8 Fluorescent Lamps

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- *See page 16 for notes.*

	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	2 F17T8	Advance	REL-2P17-RH-TP	120	36	1.03	No	IS	50
New>	2 F17T8	LG	LG232I12EN	120	31	0.89	No	IS	0
	2 F17T8	Magnetek/Triad	B232I120HP	120	33	0.90	No	IS	0
	2 F17T8	Magnetek/Triad	B232I120RH	120	33	0.92	No	IS	0
	2 F17T8	Magnetek/Triad	B232R120HP	120	36	0.91	No	Par-RS	50
	2 F17T8	Motorola	M2-IN-T8-(D)-120	120	31	0.88	No	IS	0
	2 F17T8	Motorola	M2-IN-T8-120	120	32	0.89	No	IS	0
	2 F17T8	Motorola	M2-IN-T8-GP-A-120	120	32	0.89	No	IS	0
	2 F17T8	Motorola	M2-RN-T8-1LL-(D)-12	120	31	0.88	No	RS	50
	2 F25T8	Advance	RCN-2P32	120	46	0.92	No	IS	50
	2 F25T8	Advance	REL-2S32-RH-TP	120	51	1.02	No	RS	50
	2 F25T8	Goldstar	GB-2X32/FL/I/120	120	49	0.93	No	IS	50
	2 F25T8	Kingtec	232K-120	120	52	1.01	No	RS	50
New>	2 F25T8	LG	LG232I120EN	120	45	0.88	No	IS	0
	2 F25T8	Magnetek/Triad	B232I120HP	120	46	0.90	No	IS	0
	2 F25T8	Magnetek/Triad	B232I120L	120	41	0.82*	No	IS	0
	2 F25T8	Magnetek/Triad	B232I120RH	120	46	0.91	No	IS	0
	2 F25T8	Magnetek/Triad	B232R120HP	120	50	0.92	No	Par-RS	50
	2 F25T8	Motorola	M2-IN-T8-(D)-120	120	44	0.87	No	IS	0
	2 F25T8	Motorola	M2-IN-T8-120	120	45	0.89	No	IS	0
	2 F25T8	Motorola	M2-IN-T8-GP-A-120	120	42	0.87	No	IS	0
	2 F25T8	Motorola	M2-RH-T8-1LL-120	120	65	1.25	No	RS	50
	2 F25T8	Motorola	M2-RN-T8-1LL-(D)-12	120	46	0.92	No	RS	50
	2 F32T8	Advance	RCN-2P32	120	59	0.88	Yes	IS	50
	2 F32T8	Advance	RCN-2S32	120	63	0.90	Yes	RS	50
	2 F32T8	Advance	REL-2P32-HL-RH-TP	120	78	1.18	No	IS	50
	2 F32T8	Advance	REL-2P32-LW-RH-TP	120	50	0.77*	No	IS	50
	2 F32T8	Advance	REL-2P32-RH-TP	120	59	0.87	Yes	IS	50
	2 F32T8	Advance	REL-2S32-RH-TP	120	61	0.88	No	RS	50
	2 F32T8	Advance	REL-3P32-RH-TP	120	73	1.11	No	IS	50
	2 F32T8	Advance	RIC-2S32-TP	120	61	0.86	Yes	RS	50
	2 F32T8	Advance	RIC-2S40-TP	120	82	1.15	No	RS	50
	2 F32T8	Aromat	EP232I120H2	120	61	0.95	No	IS	50
	2 F32T8	Aromat	ES232R120H2	120	64	0.95	No	RS	32
	2 F32T8	Aromat	LES232R120H2	120	54	0.72*	No	RS	32
	2 F32T8	Denki Corp.	DE232P12	120	60	0.88	No		
	2 F32T8	ELI	B232-C120	120	60	0.86	No	Par-RS	50
	2 F32T8	Energy Savings Inc.	ES-2-T8-32-120-AL1	120	67	0.95	No	RS	0
	2 F32T8	Fulham	FEP-1200-120	120	56	0.86	No		
	2 F32T8	Fulham	FEP-900-120	120	63	0.89	No		
	2 F32T8	Fulham	FEP-900-120-232-LW	120	55	0.77*	No		
	2 F32T8	Fulham	FEP-900-120-240	120	72	1.02	No		
	2 F32T8	Goldstar	GB-2X32/FL/I/120	120	60	0.90	No	IS	50
	2 F32T8	Goldstar	GB-2X32/FL/I/120/HBF	120	81	1.21	No	IS	50
	2 F32T8	Goldstar	GB-2X32/FL/I/120L	120	52	0.76*	No	IS	50
	2 F32T8	Howard Industries	EC(W)2/32IS-120	120	57	0.87	No	IS	0

Electronic Ballast List for Full Size T8 Fluorescent Lamps

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	/ Temp
	2 F32T8	Howard Industries	EC2/32IS-120	120	57	0.87	No	IS	0
New>	2 F32T8	Howard Industries	ECL2/32IS-120	120	50	0.77*	No	IS	
New>	2 F32T8	Howard Industries	EH2/32IS-120	120	78	1.14	No	IS	
New>	2 F32T8	Howard Industries	EPC2/32IS-120	120	58	0.87	No	IS	
New>	2 F32T8	K-Tronik	KT-232/IS/120LX	120	51	0.75*	No	IS	0
New>	2 F32T8	K-Tronik	KT232/IS/120	120	59	0.87	No	IS	0
	2 F32T8	Kingtec	232-K2-120-D75%	120	52	0.74*	No	RS	50
	2 F32T8	Kingtec	232K-120	120	61	0.88	No	RS	50
	2 F32T8	Kingtec	232K-120-IS	120	60	0.89	Yes	IS	50
	2 F32T8	Kingtec	232K-120I	120	61	0.89	No	IS	50
	2 F32T8	Kingtec	232K2-120	120	60	0.86	No	RS	50
New>	2 F32T8	LG	LG232I120EN	120	59	0.88	No	IS	0
	2 F32T8	Magnetek/Triad	B232I120HP	120	59	0.89	Yes	IS	0
	2 F32T8	Magnetek/Triad	B232I120HPH	120	76	1.16	No	IS	0
	2 F32T8	Magnetek/Triad	B232I120L	120	52	0.78*	No	IS	0
	2 F32T8	Magnetek/Triad	B232I120RH	120	59	0.88	Yes	IS	0
	2 F32T8	Magnetek/Triad	B232R120HP	120	62	0.89	Yes	Par-RS	50
	2 F32T8	Magnetek/Triad	B240I120HP	120	60	0.91	Yes	IS	0
	2 F32T8	Magnetek/Triad	B332I120HP	120	66	0.98	Yes	IS	0
	2 F32T8	Magnetek/Triad	B332I120RH	120	67	1.00	Yes	IS	0
	2 F32T8	Motorola	M2-IN-T8-(D)-120	120	58	0.86	No	IS	0
	2 F32T8	Motorola	M2-IN-T8-120	120	58	0.86	No	IS	0
	2 F32T8	Motorola	M2-IN-T8-GP-A-120	120	58	0.87	No	IS	0
	2 F32T8	Motorola	M2-RH-T8-1LL-120	120	89	1.28	No	RS	50
	2 F32T8	Motorola	M2-RL-T8-1LL-120	120	52	0.77*	No	RS	50
	2 F32T8	Motorola	M2-RN-T8-1LL-(D)-12	120	59	0.88	No	RS	50
New>	2 F32T8	Osram/Sylvania	QT-2x32/120HD10	120	61	0.90	No	IS	0
	2 F32T8	Osram/Sylvania	QT-2x32/120IS	120	59	0.87	No	IS	0
	2 F32T8	Osram/Sylvania	QT-2x32/120LP	120	53	0.78*	No	IS	0
	2 F32T8	Osram/Sylvania	QT-2x32/120PLUS	120	79	1.20	No	IS	0
	2 F32T8	Osram/Sylvania	QT-3x32/120IS	120	66	1.00	No	IS	0
	2 F32T8	Osram/Sylvania	QT-3x32/120LP	120	58	0.87	No	IS	0
New>	2 F32T8	Philips	HF-120-2/32 IP HL	120	78	1.18	No	IS	50
New>	2 F32T8	Philips	HFP-120-2/32 RS	120	63	0.86	No	RS	
New>	2 F32T8	Philips	SSB1-120-2/32 LH	120	64	0.95	No	RS	50
	2 F32T8	Philips	SSB2-120-2/32 IS LH	120	59	0.88	No	IS	32
New>	2 F32T8	Philips	SSB2-120-2/32 IS LH	120	50	0.78*	No	IS	50
	2 F32T8	Prescolite Controls	P120-23RS	120	64	0.90	No	RS	50
New>	2 F32T8	Robertson	RED2L10-120H	120	67	0.96	No	RS	50
	2 F32T8	Robertson	RER232-120	120	63	0.90	No	RS	50
	2 F32T8	Robertson	RER2LT8-120	120	62	0.89	No	RS	50
	2 F32T8	Robertson	RER2LT8-120-R	120	48	0.66*	No	RS	50
	2 F32T8	Robertson	RER2LT8-120H	120	77	1.12	No	RS	50
	2 F32T8	Stocker & Yale	SY12DT8	120	62	0.85	No	RS	50
New>	2 F32T8	Techmedia	232 T 120	120	64	0.90	No	Par-RS	50
New>	2 F32T8	Techmedia	232 T 120I	120	59	0.88	No	IS	50

Electronic Ballast List for Full Size T8 Fluorescent Lamps

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
New>	2 F32T8	Techmedia	232 T 120I 75%	120	51	0.75*	No	IS	50
	2 F32T8	Toshiba	FMB32IS2-120	120	59	0.90	No	IS	50
	2 F32T8	Toshiba	FMB32RP2-120	120	64	0.86	No	Par-RS	50
New>	2 F32T8	Toshiba	T232120A	120	59	0.88	No	IS	50
	2 F40T8	Magnetek/Triad	B240I120HP	120	73	0.88	No	IS	50
New>	2 F59T8	Howard Industries	E2/59IS-120	120	112	0.87	No	IS	
New>	2 F96T8	Advance	REL-2P59-S-RH-TP	120	108	0.85	No	IS	
	2 F96T8	Advance	REL-2P59-S-RH-TP	120	108	0.86	Yes	IS	50
	2 F96T8	Aromat	EP259I120H2	120	111	0.89	No	IS	50
	2 F96T8	Fulham	FEP-1800-120-296	120	114	0.92	No		
	2 F96T8	Magnetek/Triad	B259I120HP	120	111	0.88	No	IS	50
	2 F96T8	Magnetek/Triad	B259I120HPL	120	97	0.76*	No	IS	50
New>	2 F96T8	Magnetek/Triad	B259I120RHH	120	148	1.17	No	IS	
	2 F96T8	Motorola	M2-IL-T8-8FT-120	120	104	0.85	No	IS	50
	2 F96T8	Osram/Sylvania	QT-2x59/120IS	120	109	0.86	No	IS	0
New>	2 F96T8	Osram/Sylvania	QT-2x59/120PLUS	120	149	1.17	No	IS	0
New>	2 F96T8	Philips	SSB2-120-2/59 IS LH	120	111	0.89	No	IS	50
New>	2 F96T8	Techmedia	296 T 120 T8	120	112	0.90	No	IS	50
	2 F96T8	Toshiba	FMB59IS2-120	120	108	0.84*	No	IS	50
	2 F96T8/HO	Advance	REL-2S86-RH-TP	120	162	0.89	No	RS	50
	2 F96T8/HO	Philips Lighting	PLC-2E86-120HO	120	162	0.90	No	RS	50
	2 FT39T5	Advance	REL-2TT-S-39-RH-TP	120	71	1.04	No	RS	32
	2 FT39T5	Magnetek/Triad	B240R120HP	120	75	0.92	No	Par-RS	50
	2 FT40T5	Advance	REL-2TT-S-40-RH-TP	120	71	0.91	No	RS	32
	2 FT40T5	Denki Corp.	DE240P12PL	120	71	0.87	No		
	2 FT40T5	Goldstar	GB-2X32/FL/I/120	120	71	0.88	No	IS	50
	2 FT40T5	Magnetek/Triad	B240I120HP	120	70	0.87	Yes	IS	50
	2 FT40T5	Magnetek/Triad	B340I120HP	120	76	0.95	No	IS	50
New>	2 FT40T5	Magnetek/Triad	C240I120RH	120	70	0.87	No	IS	50
New>	2 FT40T5	Magnetek/Triad	C340I120RH	120	78	0.97	No	IS	50
	2 FT50T5	Advance	REL-2TT-S-50-RH-TP	120	107	1.04	No	RS	32
	2 FT55T5	Osram/Sylvania	QT-2x55/120IS	120	113	0.86	No	IS	0
	2 F17T8	Goldstar	GB-2X32/FL/I/277	277	35	0.94	No	IS	50
New>	2 F17T8	LG	LG232I277EN	277	32	0.88	No	IS	0
	2 F17T8	Magnetek/Triad	B232I277HP	277	33	0.89	No	IS	0
	2 F17T8	Magnetek/Triad	B232I277RH	277	33	0.91	No	IS	0
	2 F17T8	Magnetek/Triad	B232R277HP	277	37	0.92	No	Par-RS	50
	2 F17T8	Magnetek/Triad	B332I277HP	277	38	1.03	No	IS	0
	2 F17T8	Motorola	M2-IN-T8-(D)-277	277	33	0.91	No	IS	0
	2 F17T8	Motorola	M2-IN-T8-277	277	30	0.88	No	IS	0
	2 F17T8	Motorola	M2-IN-T8-GP-A-277	277	35	0.93	No	IS	0
	2 F17T8	Motorola	M2-RN-T8-1LL-(D)-27	277	30	0.86	No	RS	50
New>	2 F17T8	Osram/Sylvania	QT-2x32/277HD10	277	60	0.90	No	IS	0
	2 F25T8	Advance	VCN-2P32	277	46	0.92	No	IS	50
	2 F25T8	Advance	VEL-2S32-RH-TP	277	50	0.99	No	RS	50

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	2 F25T8	Kingtec	232K2-277	277	50	0.90	No	RS	50
New>	2 F25T8	LG	LG232I277EN	277	45	0.88	No	IS	0
	2 F25T8	Magnetek/Triad	B232I277HP	277	46	0.90	No	IS	0
	2 F25T8	Magnetek/Triad	B232I277L	277	41	0.81*	No	IS	0
	2 F25T8	Magnetek/Triad	B232I277RH	277	46	0.92	No	IS	0
	2 F25T8	Magnetek/Triad	B232R277HP	277	50	0.93	No	Par-RS	50
	2 F25T8	Magnetek/Triad	B332I277HP	277	51	1.03	No	IS	0
	2 F25T8	Motorola	M2-IN-T8-(D)-277	277	46	0.88	No	IS	0
	2 F25T8	Motorola	M2-IN-T8-277	277	43	0.89	No	IS	0
	2 F25T8	Motorola	M2-IN-T8-GP-A-277	277	47	0.90	No	IS	0
	2 F25T8	Motorola	M2-RH-T8-1LL-277	277	62	1.23	No	RS	50
	2 F25T8	Motorola	M2-RN-T8-1LL-(D)-27	277	45	0.89	No	RS	50
	2 F32T8	Advance	VCN-2P32	277	59	0.88	Yes	IS	50
	2 F32T8	Advance	VEL-2P32-HL-RH-TP	277	77	1.21	No	IS	50
	2 F32T8	Advance	VEL-2P32-LW-RH-TP	277	51	0.78*	No	IS	50
	2 F32T8	Advance	VEL-2P32-RH-TP	277	58	0.87	Yes	IS	50
	2 F32T8	Advance	VEL-2S32-RH-TP	277	60	0.91	No	RS	50
	2 F32T8	Advance	VIC-2S32-TP	277	63	0.88	No	RS	50
	2 F32T8	Advance	VIC-2S40-TP	277	75	1.07	No	RS	50
	2 F32T8	Aromat	EP232I277H2	277	61	0.93	No	IS	50
	2 F32T8	Aromat	ES232R277H2	277	62	0.94	No	RS	32
	2 F32T8	Aromat	LES232R277H2	277	52	0.72*	No	RS	32
	2 F32T8	Denki Corp.	DE232P27	277	60	0.87	No		
	2 F32T8	ELI	B232-C277	277	59	0.86	No	Par-RS	50
	2 F32T8	Energy Savings Inc.	ES-2-T8-32-277-AL1	277	68	0.99	No	RS	0
New>	2 F32T8	Energy Savings Inc.	ES-2-T8-32-277-ASI-1	277	81	1.25	No	RS	0
New>	2 F32T8	Energy Savings Inc.	ES-2-T8-32-277-WS	277	58	0.88	No	RS	0
	2 F32T8	Fulham	FEP-1200-277	277	62	0.86	No		
	2 F32T8	Fulham	FEP-900-277	277	59	0.84*	No		
	2 F32T8	Fulham	FEP-900-277-232-LW	277	55	0.80*	No		
	2 F32T8	Goldstar	GB-2X32/FL/I/277	277	61	0.91	No	IS	50
	2 F32T8	Goldstar	GB-2X32/FL/I/277/HBF	277	81	1.20	No	IS	50
	2 F32T8	Goldstar	GB-2X32/FL/I/277L	277	53	0.76*	No	IS	50
	2 F32T8	Howard Industries	EC(W)2/32IS-277	277	58	0.89	No	IS	0
	2 F32T8	Howard Industries	EC2/32IS-277	277	58	0.89	No	IS	0
New>	2 F32T8	Howard Industries	ECL2/32IS-277	277	51	0.76*	No	IS	
New>	2 F32T8	Howard Industries	EH2/32IS-277	277	76	1.14	No	IS	
New>	2 F32T8	Howard Industries	EPC2/32IS-277	277	58	0.87	No	IS	
New>	2 F32T8	K-Tronik	KT-232/IS/277LX	277	51	0.77*	No	IS	0
New>	2 F32T8	K-Tronik	KT232/IS/277	277	62	0.94	No	IS	0
	2 F32T8	Kingtec	232-K2-227-D75%	277	52	0.75*	No	RS	50
	2 F32T8	Kingtec	232K-277-IS	277	59	0.90	Yes	IS	50
	2 F32T8	Kingtec	232K2-277	277	60	0.88	No	RS	50
	2 F32T8	Kingtec	232K277	277	63	0.94	No	RS	50
New>	2 F32T8	LG	LG232I277EN	277	58	0.87	No	IS	0
	2 F32T8	Magnetek/Triad	B232I277HP	277	58	0.87	Yes	IS	0

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	/ Temp
	2 F32T8	Magnetek/Triad	B232I277HPH	277	75	1.15	Yes	IS	0
	2 F32T8	Magnetek/Triad	B232I277L	277	51	0.78*	No	IS	0
	2 F32T8	Magnetek/Triad	B232I277RH	277	59	0.88	Yes	IS	0
	2 F32T8	Magnetek/Triad	B232R277HP	277	64	0.89	Yes	Par-RS	50
	2 F32T8	Magnetek/Triad	B240I277HP	277	60	0.90	Yes	IS	0
	2 F32T8	Magnetek/Triad	B332I277HP	277	67	0.99	Yes	IS	0
	2 F32T8	Magnetek/Triad	B332I277RH	277	66	1.02	Yes	IS	0
	2 F32T8	Magnetek/Triad	B332R277HP	277	67	0.96	Yes	Par-RS	50
	2 F32T8	Motorola	M2-IN-T8-(D)-277	277	58	0.87	No	IS	0
	2 F32T8	Motorola	M2-IN-T8-277	277	56	0.87	No	IS	0
	2 F32T8	Motorola	M2-IN-T8-GP-A-277	277	60	0.89	No	IS	0
	2 F32T8	Motorola	M2-RH-T8-1LL-277	277	86	1.25	No	RS	50
	2 F32T8	Motorola	M2-RL-T8-1LL-277	277	54	0.80*	No	RS	50
	2 F32T8	Motorola	M2-RN-T8-1LL-(D)-27	277	59	0.89	No	RS	50
	2 F32T8	Osram/Sylvania	QT-2x32/277IS	277	58	0.87	No	IS	0
	2 F32T8	Osram/Sylvania	QT-2x32/277LP	277	51	0.77*	No	IS	0
	2 F32T8	Osram/Sylvania	QT-2x32/277PLUS	277	78	1.21	No	IS	0
	2 F32T8	Osram/Sylvania	QT-3x32/277IS	277	66	1.00	No	IS	0
	2 F32T8	Osram/Sylvania	QT-3x32/277LP	277	57	0.86	No	IS	0
New>	2 F32T8	Philips	HF-277-2/32 IP HL	277	77	1.21	No	IS	50
New>	2 F32T8	Philips	HFP-277-2/32 RS	277	63	0.85*	No	RS	
New>	2 F32T8	Philips	SSB1-277-2/32 LH	277	62	0.94	No	RS	50
	2 F32T8	Philips	SSB2-277-2/32 IS LH	277	59	0.88	No	IS	32
New>	2 F32T8	Philips	SSB2-277-2/32 IS LH	277	51	0.79*	No	IS	50
	2 F32T8	Prescolite Controls	P277-23RS	277	59	0.87	No	RS	50
New>	2 F32T8	Robertson	RED2L10-277H	277	65	0.94	No	RS	50
	2 F32T8	Robertson	RER232-277	277	64	0.93	No	RS	50
	2 F32T8	Robertson	RER2LT8-277	277	62	0.91	No	RS	50
	2 F32T8	Robertson	RER2LT8-277-R	277	47	0.64*	No	RS	50
	2 F32T8	Robertson	RER2LT8-277H	277	73	1.09	No	RS	50
	2 F32T8	Stocker & Yale	SY27DT8	277	62	0.88	No	RS	50
New>	2 F32T8	Techmedia	232 T 277	277	61	0.92	No	Par-RS	50
New>	2 F32T8	Techmedia	232 T 277I	277	60	0.91	No	IS	50
New>	2 F32T8	Techmedia	232 T 277I 75%	277	51	0.77*	No	IS	50
	2 F32T8	Toshiba	FMB32IS2-277	277	59	0.90	No	IS	50
	2 F32T8	Toshiba	FMB32RP2-277	277	60	0.84*	No	Par-RS	50
New>	2 F32T8	Toshiba	T232277A	277	62	0.92	No	IS	50
	2 F40T8	Magnetek/Triad	B240I277HP	277	72	0.88	No	IS	50
New>	2 F59T8	Howard Industries	E2/59IS-277	277	111	0.88	No	IS	
	2 F96T8	Advance	VEL-2P59-S-RH-TP	277	109	0.88	No	IS	50
New>	2 F96T8	Advance	VEL-2P59-S-RH-TP	277	109	0.88	No		
	2 F96T8	Aromat	EP259I277H2	277	112	0.90	No	IS	50
	2 F96T8	Magnetek/Triad	B259I277HP	277	108	0.88	No	IS	50
	2 F96T8	Magnetek/Triad	B259I277HPL	277	97	0.76*	No	IS	50
New>	2 F96T8	Magnetek/Triad	B259I277RHH	277	148	1.19	No	IS	
New>	2 F96T8	Motorola	M2-IL-T8-8FT-277	277	103	0.83*	No	IS	50

Electronic Ballast List for Full Size T8 Fluorescent Lamps

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	2 F96T8	Osram/Sylvania	QT-2x59/277IS	277	110	0.90	No	IS	0
New>	2 F96T8	Osram/Sylvania	QT-2x59/277PLUS	277	144	1.15	No	IS	0
New>	2 F96T8	Philips	SSB2-277-2/59 IS LH	277	112	0.90	No	IS	50
New>	2 F96T8	Techmedia	296 T 277 T8	277	111	0.89	No	IS	50
	2 F96T8	Toshiba	FMB59IS2-277	277	110	0.87	No	IS	50
	2 F96T8/HO	Advance	VEL-2S86-RH-TP	277	155	0.85	No	RS	50
	2 F96T8/HO	Philips Lighting	PLC-2E86-277HO	277	155	0.86	No	RS	50
	2 FT39T5	Advance	VEL-2TT-S-39-RH-TP	277	71	1.03	No	RS	32
	2 FT39T5	Magnetek/Triad	B240R277HP	277	76	0.92	No	Par-RS	50
	2 FT40T5	Advance	VEL-2TT-S-40-RH-TP	277	70	0.90	No	RS	32
	2 FT40T5	Denki Corp.	DE240P27PL	277	70	0.87	No		
	2 FT40T5	Goldstar	GB-2X32/FL/I/277	277	72	0.89	No	IS	50
	2 FT40T5	Magnetek/Triad	B240I277HP	277	69	0.86	Yes	IS	50
	2 FT40T5	Magnetek/Triad	B340I277HP	277	76	0.94	Yes	IS	50
New>	2 FT40T5	Magnetek/Triad	C240I277RH	277	69	0.87	Yes	IS	50
New>	2 FT40T5	Magnetek/Triad	C340I277RH	277	77	0.97	Yes	IS	50
	2 FT40T5	Motorola	M2-RN-T5/40-1LL-277	277	68	0.79*	No	RS	50
	2 FT50T5	Advance	VEL-2TT-S-50-RH-TP	277	105	1.06	No	RS	32
	2 FT55T5	Osram/Sylvania	QT-2x55/277IS	277	113	0.88	No	IS	0
New>	2 F32T8	K-Tronik	KT232/IS/347	347	61	0.91	No	IS	0
New>	2 F32T8	Techmedia	232 T 347	347	61	0.87	No	Par-RS	50
New>	2 F32T8	Techmedia	232 T 347I 75%	347	50	0.75*	No	IS	50
New>	2 F96T8	Techmedia	296 T 347 T8	347	112	0.87	No	IS	50
New>	2 F96T8	Techmedia	296 T 347 T8 75%	347	97	0.75*	No	IS	50
	3 F17T8	Advance	RCN-3P32	120	48	0.96	No	IS	50
	3 F17T8	Motorola	M3-IN-T8-120	120	46	0.87	No	IS	0
	3 F17T8	Motorola	M3-IN-T8-GP-A-120	120	47	0.87	No	IS	0
	3 F17T8	Motorola	M3-RL-T8-1LL-120	120	41	0.77*	No	RS	50
	3 F17T8	Osram/Sylvania	QT-3x17/120IS	120	52	1.03	No	IS	0
	3 F25T8	Advance	RCN-3P32	120	67	0.93	No	IS	50
	3 F25T8	Advance	REL-3P32-RH-TP	120	72	0.98	No	IS	50
	3 F25T8	Advance	RIC-3S32-TP	120	69	0.87	No	RS	50
	3 F25T8	Goldstar	GB-3X32/FL/I/120	120	71	0.93	No	IS	50
	3 F25T8	Magnetek/Triad	B332I120RH	120	68	0.92	No	IS	0
	3 F25T8	Magnetek/Triad	B332I277L	120	60	0.81*	No	IS	0
	3 F25T8	Magnetek/Triad	B332R120HP	120	67	0.92	No	Par-RS	50
	3 F25T8	Motorola	M3-IN-T8-120	120	64	0.89	No	IS	0
	3 F25T8	Motorola	M3-IN-T8-GP-A-120	120	65	0.86	No	IS	0
	3 F25T8	Motorola	M3-RL-T8-1LL-120	120	62	0.80*	No	RS	50
	3 F32T8	Advance	RCN-3P32	120	89	0.92	Yes	IS	50
	3 F32T8	Advance	REL-3P32-LW-RH-TP	120	76	0.77*	No	IS	50
	3 F32T8	Advance	REL-3P32-RH-TP	120	93	0.95	Yes	IS	50
	3 F32T8	Advance	REL-3S32-RH-TP	120	97	0.94	No	RS	50
	3 F32T8	Advance	RIC-3S32-TP	120	97	0.88	No	RS	50

Electronic Ballast List for Full Size T8 Fluorescent Lamps

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	3 F32T8	Aromat	EP332I120H2	120	90	0.94	No	IS	50
	3 F32T8	Aromat	ES332R120H2	120	97	0.94	No	RS	32
	3 F32T8	Aromat	LES332R120H2	120	80	0.76*	No	RS	32
	3 F32T8	Denki Corp.	DE332P12	120	90	0.89	No		
	3 F32T8	Fulham	FEP-900-120-332	120	87	0.87	No		
	3 F32T8	Goldstar	GB-3x32/FL/I/120	120	93	0.93	No	IS	50
	3 F32T8	Goldstar	GB-3X32/FL/I/120L	120	79	0.77*	No	IS	50
	3 F32T8	Howard Industries	EC(W)3/32IS-120	120	85	0.87	No	IS	0
	3 F32T8	Howard Industries	EC3/32IS-120	120	85	0.87	No	IS	0
New>	3 F32T8	Howard Industries	ECL3/32IS-120	120	74	0.76*	No	IS	
New>	3 F32T8	Howard Industries	ECP3/32IS-120	120	85	0.86	No	IS	
New>	3 F32T8	Howard Industries	EH3/32IS-120	120	114	1.14	No	IS	
New>	3 F32T8	K-Tronik	KT332/IS/120	120	91	0.90	No	IS	0
	3 F32T8	Kingtec	432K-120	120	93	0.88	Yes	IS	50
New>	3 F32T8	LG	LG332I120EN	120	87	0.89	No	IS	0
	3 F32T8	Magnetek/Triad	B332I120HP	120	88	0.90	Yes	IS	0
	3 F32T8	Magnetek/Triad	B332I120L	120	76	0.78*	No	IS	0
	3 F32T8	Magnetek/Triad	B332I120RH	120	88	0.89	Yes	IS	0
	3 F32T8	Magnetek/Triad	B332R120HP	120	91	0.89	Yes	Par-RS	50
	3 F32T8	Magnetek/Triad	B340I120HP	120	88	0.91	Yes	IS	0
	3 F32T8	Magnetek/Triad	B432I120HP	120	92	0.95	Yes	Par-RS	50
	3 F32T8	Magnetek/Triad	B432I120RH	120	93	0.97	Yes	IS	50
	3 F32T8	Magnetek/Triad	B432R120HP	120	101	0.96	Yes	Par-RS	50
	3 F32T8	Motorola	M3-IN-T8-120	120	86	0.86	No	IS	0
	3 F32T8	Motorola	M3-IN-T8-GP-A-120	120	84	0.86	No	IS	0
	3 F32T8	Motorola	M3-RL-T8-1LL-120	120	78	0.76*	No	RS	50
	3 F32T8	Motorola	M3-RN-T8-1LL-120	120	87	0.87	No	RS	50
New>	3 F32T8	Osram/Sylvania	QT-3x32/120HD10	120	89	0.92	No	IS	0
	3 F32T8	Osram/Sylvania	QT-3x32/120IS	120	87	0.89	No	IS	0
	3 F32T8	Osram/Sylvania	QT-3x32/120LP	120	76	0.77*	No	IS	0
New>	3 F32T8	Osram/Sylvania	QT-3x32/120PLUS	120	115	1.17	No	IS	0
	3 F32T8	Osram/Sylvania	QT-4x32/120IS	120	94	0.97	No	IS	0
	3 F32T8	Osram/Sylvania	QT-4x32/120LP	120	83	0.85	No	IS	0
New>	3 F32T8	Philips	HFP-120-3/32 RS	120	93	0.87	No	RS	
New>	3 F32T8	Philips	SSB1-120-3/32 LH	120	97	0.94	No	RS	50
	3 F32T8	Philips	SSB2-120-3/32 IS LH	120	92	0.90	No	IS	32
New>	3 F32T8	Philips	SSB2-120-3/32 IS LH	120	75	0.78*	No	IS	50
	3 F32T8	Robertson	RER332-120	120	91	0.90	No	RS	50
New>	3 F32T8	Techmedia	332 T 120I	120	87	0.89	No	IS	50
	3 F32T8	Toshiba	FMB32IS3-120	120	88	0.90	No	IS	50
	3 F32T8	Toshiba	FMB32RP3-120	120	91	0.85	No	Par-RS	50
New>	3 F32T8	Toshiba	T332120A	120	116	0.88	No	IS	50
	3 F40T8	Advance	RCN-3P32	120	106	0.92	No	IS	50
	3 F40T8	Goldstar	GB-3X32/FL/I/120	120	110	0.88	No	IS	50
	3 F40T8	Magnetek/Triad	B340I120HP	120	107	0.88	No	IS	50
	3 FT39T5	Magnetek/Triad	B340R120HP	120	107	0.89	No	Par-RS	50

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	3 FT40T5	Goldstar	GB-3X32/FL/I/120	120	105	0.87	No	IS	50
	3 FT40T5	Magnetek/Triad	B340I120HP	120	102	0.87	Yes	IS	50
New>	3 FT40T5	Magnetek/Triad	C340I120RH	120	104	0.88	No	IS	50
	3 F17T8	Advance	VCN-3P32	277	49	0.94	No	IS	50
	3 F17T8	Magnetek/Triad	B332I277HP	277	50	0.94	No	IS	0
	3 F17T8	Magnetek/Triad	B332R277HP	277	47	0.90	No	Par-RS	50
	3 F17T8	Motorola	M3-IN-T8-277	277	46	0.90	No	IS	0
	3 F17T8	Motorola	M3-IN-T8-GP-A-277	277	47	0.90	No	IS	0
	3 F17T8	Motorola	M3-RN-T8-1LL-277	277	42	0.81*	No	RS	50
	3 F17T8	Osram/Sylvania	QT-3x17/277	277	52	1.02	No	IS	0
	3 F25T8	Advance	VCN-3P32	277	68	0.95	No	IS	50
	3 F25T8	Advance	VEL-3P32-RH-TP	277	63	0.87	No	IS	50
	3 F25T8	Advance	VIC-3S32-TP	277	67	0.87	No	RS	50
	3 F25T8	Goldstar	GB-3X32/FLI/277	277	70	0.94	No	IS	50
	3 F25T8	Magnetek/Triad	B332I277HP	277	68	0.95	No	IS	0
	3 F25T8	Magnetek/Triad	B332I277L	277	60	0.82*	No	IS	0
	3 F25T8	Magnetek/Triad	B332I277RH	277	68	0.93	No	IS	0
	3 F25T8	Magnetek/Triad	B332R277HP	277	67	0.92	No	Par-RS	50
	3 F25T8	Motorola	M3-IN-T8-277	277	65	0.90	No	IS	0
	3 F25T8	Motorola	M3-IN-T8-GP-A-277	277	65	0.88	No	IS	0
	3 F25T8	Motorola	M3-RN-T8-1LL-277	277	66	0.86	No	RS	50
	3 F32T8	Advance	VCN-3P32	277	89	0.93	Yes	IS	50
	3 F32T8	Advance	VEL-3P32-LW-RH-TP	277	75	0.78*	No	IS	50
	3 F32T8	Advance	VEL-3P32-RH-TP	277	93	0.96	Yes	IS	50
	3 F32T8	Advance	VEL-3S32-RH-TP	277	95	0.94	No	RS	50
	3 F32T8	Advance	VIC-3S32-TP	277	95	0.87	No	RS	50
	3 F32T8	Aromat	EP332I277H2	277	91	0.97	No	IS	50
	3 F32T8	Aromat	ES332R277H2	277	95	0.94	No	RS	32
	3 F32T8	Aromat	LES332R277H2	277	78	0.75*	No	RS	32
	3 F32T8	Denki Corp.	DE332P27	277	92	0.92	No		
	3 F32T8	Fulham	FEP-900-277-332	277	87	0.87	No		
	3 F32T8	Fulham	FEP-900-277-332-LW	277	75	0.74*	No		
	3 F32T8	Goldstar	GB-3X32/FL/I/277	277	91	0.92	No	IS	50
	3 F32T8	Goldstar	GB-3X32/FL/I/277L	277	78	0.77*	No	IS	50
	3 F32T8	Howard Industries	EC(W)3/32IS-277	277	85	0.89	No	IS	0
	3 F32T8	Howard Industries	EC3/32IS-277	277	85	0.89	No	IS	0
New>	3 F32T8	Howard Industries	ECL3/32IS-277	277	73	0.76*	No	IS	
New>	3 F32T8	Howard Industries	EH3/32IS-277	277	112	1.14	No	IS	
New>	3 F32T8	Howard Industries	EPC3/32IS-277	277	85	0.87	No	IS	
New>	3 F32T8	K-Tronik	KT332/IS/277	277	88	0.91	No	IS	0
	3 F32T8	Kingtec	432K-277	277	96	0.96	Yes	IS	50
New>	3 F32T8	LG	LG332I277EN	277	88	0.89	No	IS	0
	3 F32T8	Magnetek/Triad	B332I277HP	277	88	0.90	Yes	IS	0
	3 F32T8	Magnetek/Triad	B332I277L	277	76	0.79*	No	IS	0
	3 F32T8	Magnetek/Triad	B332I277RH	277	88	0.91	Yes	IS	0

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	Lamp		Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	/ Temp
	3	F32T8	Magnetek/Triad	B332R277HP	277	86	0.89	Yes	Par-RS	50
	3	F32T8	Magnetek/Triad	B340I277HP	277	88	0.91	No	IS	0
	3	F32T8	Magnetek/Triad	B432I277HP	277	92	0.95	Yes	IS	50
	3	F32T8	Magnetek/Triad	B432I277RH	277	92	0.96	Yes	IS	50
	3	F32T8	Magnetek/Triad	B432R277HP	277	102	0.95	Yes	Par-RS	50
	3	F32T8	Motorola	M3-IN-T8-277	277	87	0.88	No	IS	0
	3	F32T8	Motorola	M3-IN-T8-GP-A-277	277	82	0.85	No	IS	0
	3	F32T8	Motorola	M3-RL-T8-1LL-277	277	76	0.77*	No	RS	50
	3	F32T8	Motorola	M3-RN-T8-1LL-277	277	90	0.86	No	RS	50
New>	3	F32T8	Osram/Sylvania	QT-3x32/277HD10	277	88	0.90	No	IS	0
	3	F32T8	Osram/Sylvania	QT-3x32/277IS	277	87	0.90	No	IS	0
	3	F32T8	Osram/Sylvania	QT-3x32/277LP	277	76	0.78*	No	IS	0
New>	3	F32T8	Osram/Sylvania	QT-3x32/277PLUS	277	114	1.17	No	IS	0
	3	F32T8	Osram/Sylvania	QT-4x32/277IS	277	93	0.96	No	IS	0
	3	F32T8	Osram/Sylvania	QT-4x32/277LP	277	81	0.84*	No	IS	0
New>	3	F32T8	Philips	HFP-277-3/32 RS	277	94	0.88	No	RS	
New>	3	F32T8	Philips	SSB1-277-3/32 LH	277	95	0.94	No	RS	50
	3	F32T8	Philips	SSB2-277-3/32 IS LH	277	95	0.90	No	IS	32
New>	3	F32T8	Philips	SSB2-277-3/32 IS LH	277	75	0.80*	No	IS	50
New>	3	F32T8	Techmedia	332 T 277I	277	86	0.89	No	IS	50
	3	F32T8	Toshiba	FMB32IS3-277	277	91	0.95	No	IS	50
	3	F32T8	Toshiba	FMB32RP3-277	277	87	0.85	No	Par-RS	50
New>	3	F32T8	Toshiba	T332277A	277	88	0.90	No	IS	50
	3	F40T8	Advance	VCN-3P32	277	107	0.93	No	IS	50
	3	F40T8	Goldstar	GB-3X32/FLI/277	277	110	0.91	No	IS	50
	3	F40T8	Magnetek/Triad	B340I277HP	277	107	0.88	No	IS	50
	3	FT40T5	Goldstar	GB-3X32/FLI/277	277	106	0.89	No	IS	50
	3	FT40T5	Magnetek/Triad	B340I277HP	277	102	0.86	Yes	IS	50
New>	3	FT40T5	Magnetek/Triad	C340I277RH	277	99	0.89	Yes	IS	50
New>	3	F32T8	Techmedia	332 T 347I	347	91	0.91	No	IS	50
	4	F17T8	Advance	RCN-4P32	120	60	0.91	No	IS	50
	4	F17T8	Advance	REL-4P32-RH-TP	120	65	0.92	No	IS	50
New>	4	F17T8	ELI	B342-I120	120	60	0.88	No	IS	50
	4	F17T8	Magnetek/Triad	B432I120HP	120	62	0.90	No	IS	50
	4	F17T8	Magnetek/Triad	B432R120HP	120	68	0.90	No	Par-RS	50
	4	F17T8	Motorola	M4-IN-T8-GP-A-120	120	61	0.88	No	IS	0
	4	F17T8	Motorola	M4-RN-T8-1LL-120	120	61	0.83*	No	RS	50
	4	F25T8	Advance	RCN-4P32	120	86	0.90	No	IS	50
	4	F25T8	Advance	REL-4P32-LW-RH-TP	120	78	0.80*	No	IS	50
	4	F25T8	Advance	REL-4P32-RH-TP	120	82	0.86	No	IS	50
New>	4	F25T8	ELI	B432-I120	120	86	0.87	No	IS	50
	4	F25T8	Goldstar	GB-4X32/FL/I/120	120	89	0.89	No	IS	50
	4	F25T8	Magnetek/Triad	B432I120HP	120	89	0.91	No	IS	50

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	Lamp		Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	/ Temp
	4	F25T8	Magnetek/Triad	B432I120L	120	80	0.82*	No	IS	50
	4	F25T8	Magnetek/Triad	B432I120RH	120	89	0.91	No	IS	50
	4	F25T8	Magnetek/Triad	B432R120HP	120	94	0.92	No	Par-RS	50
	4	F25T8	Motorola	M4-IN-T8-120	120	85	0.88	No	IS	0
	4	F25T8	Motorola	M4-IN-T8-GP-A-120	120	85	0.87	No	IS	0
	4	F25T8	Motorola	M4-RN-T8-1LL-120	120	92	0.88	No	RS	50
	4	F32T8	Advance	RCN-4P32	120	112	0.88	Yes	IS	50
	4	F32T8	Advance	REL-4P32-LW-RH-TP	120	99	0.77*	No	IS	50
	4	F32T8	Advance	REL-4P32-RH-TP	120	107	0.82*	No	IS	50
	4	F32T8	Aromat	EP432I120H2	120	106	0.82*	No	IS	50
	4	F32T8	Aromat	LEP432I120H2	120	100	0.76*	No	IS	50
	4	F32T8	Denki Corp.	DE432P12	120	112	0.84*	No		
New>	4	F32T8	ELI	B432-I120	120	112	0.87	No	IS	50
	4	F32T8	Fulham	FEP-900-120-432	120	111	0.87	No		
	4	F32T8	Fulham	FEP-900-120-432-LW	120	108	0.77*	No		
	4	F32T8	Goldstar	GB-4X32/FL/I/120	120	113	0.86	No	IS	50
	4	F32T8	Goldstar	GB-4X32/FL/I/120/L	120	99	0.75*	No	IS	50
	4	F32T8	Howard Industries	EC(W)4/32IS-120	120	113	0.88	No	IS	0
	4	F32T8	Howard Industries	EC4/32IS-120	120	113	0.88	No	IS	0
New>	4	F32T8	Howard Industries	ECL4/32IS-120	120	98	0.75*	No	IS	
New>	4	F32T8	Howard Industries	EPC4/32IS-120	120	113	0.86	No	IS	
New>	4	F32T8	K-Tronik	KT-432/IS/120LX	120	100	0.76*	No	IS	0
New>	4	F32T8	K-Tronik	KT432/IS/120	120	114	0.86	No	IS	0
	4	F32T8	Kingtec	432K-120	120	114	0.88	Yes	IS	50
	4	F32T8	Kingtec	432K120 75%	120	98	0.75*	No	IS	50
	4	F32T8	Magnetek/Triad	B432I120HP	120	113	0.88	Yes	IS	50
	4	F32T8	Magnetek/Triad	B432I120L	120	101	0.79*	No	IS	50
	4	F32T8	Magnetek/Triad	B432I120RH	120	114	0.89	Yes	IS	50
	4	F32T8	Magnetek/Triad	B432R120HP	120	123	0.89	Yes	Par-RS	50
	4	F32T8	Motorola	M4-IN-T8-120	120	113	0.88	No	IS	0
	4	F32T8	Motorola	M4-IN-T8-GP-A-120	120	111	0.86	No	IS	0
	4	F32T8	Motorola	M4-RL-T8-1LL-120	120	105	0.83*	No	RS	50
	4	F32T8	Motorola	M4-RN-T8-1LL-120	120	116	0.85	No	RS	50
New>	4	F32T8	Osram/Sylvania	QT-4x32/120HD10	120	114	0.89	No	IS	0
	4	F32T8	Osram/Sylvania	QT-4x32/120IS	120	115	0.90	No	IS	0
	4	F32T8	Osram/Sylvania	QT-4x32/120LP	120	101	0.77*	No	IS	0
New>	4	F32T8	Philips	SSB2-120-4/32 IS LH	120	113	0.85	No	IS	32
	4	F32T8	Philips	SSB2-120-4/32 IS LH	120	100	0.75*	No	IS	50
	4	F32T8	Robertson	RER432-120	120	120	0.89	No	RS	50
	4	F32T8	Robertson	RER432-120R	120	102	0.72*	No	RS	50
New>	4	F32T8	Techmedia	432 T 120I	120	110	0.85*	No	IS	50
	4	F32T8	Toshiba	FMB32IS4-120	120	106	0.83*	No	IS	50
	4	F32T8	Toshiba	FMB32RP4-120	120	119	0.82*	No	Par-RS	50
New>	4	F32T8	Toshiba	T432120A	120	113	0.86	No	IS	50
	4	F17T8	Advance	VCN-4P32	277	61	0.93	No	IS	50

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- *See page 16 for notes.*

	Lamp		Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	4	F17T8	Magnetek/Triad	B432I277HP	277	60	0.88	No	IS	50
	4	F17T8	Magnetek/Triad	B432R277HP	277	72	0.92	No	Par-RS	50
	4	F17T8	Motorola	M4-IN-T8-277	277	60	0.89	No	IS	0
	4	F17T8	Motorola	M4-RL-T8-1LL-277	277	50	0.73*	No	RS	50
	4	F17T8	Motorola	M4-RN-T8-1LL-277	277	61	0.89	No	RS	50
	4	F25T8	Advance	VCN-4P32	277	85	0.92	No	IS	50
	4	F25T8	Goldstar	GB-4X32/FL/I/277	277	88	0.90	No	IS	50
	4	F25T8	Magnetek/Triad	B432I277HP	277	87	0.90	No	IS	50
	4	F25T8	Magnetek/Triad	B432I277L	277	79	0.82*	No	IS	50
	4	F25T8	Magnetek/Triad	B432I277RH	277	87	0.91	No	IS	50
	4	F25T8	Magnetek/Triad	B432R277HP	277	98	0.93	No	Par-RS	50
	4	F25T8	Motorola	M4-IN-T8-277	277	84	0.89	No	IS	0
	4	F25T8	Motorola	M4-IN-T8-GP-A-277	277	86	0.88	No	IS	0
	4	F25T8	Motorola	M4-RL-T8-1LL-277	277	77	0.76*	No	RS	50
	4	F25T8	Motorola	M4-RN-T8-1LL-277	277	89	0.91	No	RS	50
	4	F32T8	Advance	VCN-4P32	277	109	0.88	Yes	IS	50
	4	F32T8	Advance	VEL-4P32-LW-RH-TP	277	98	0.77*	No	IS	50
	4	F32T8	Advance	VEL-4P32-RH-TP	277	109	0.84*	No	IS	50
	4	F32T8	Aromat	EP432I277H2	277	108	0.85	No	IS	50
	4	F32T8	Aromat	LEP432I277H2	277	99	0.76*	No	IS	50
	4	F32T8	Denki Corp.	DE432P27	277	110	0.82*	No		
	4	F32T8	Fulham	FEP-900-277-432	277	106	0.87	No		
	4	F32T8	Fulham	FEP-900-277-432-LW	277	99	0.73*	No		
	4	F32T8	Goldstar	GB-4x32/FL/I/277	277	115	0.87	No	IS	50
	4	F32T8	Goldstar	GB-4X32/FL/I/277L	277	98	0.76*	No	IS	50
	4	F32T8	Howard Industries	EC(W)4/32IS-277	277	111	0.87	No	IS	0
	4	F32T8	Howard Industries	EC4/32IS-277	277	111	0.87	No	IS	0
New>	4	F32T8	Howard Industries	ECL4/32IS-277	277	97	0.76*	No	IS	
New>	4	F32T8	Howard Industries	EPC4/32IS-277	277	113	0.88	No	IS	
New>	4	F32T8	K-Tronik	KT432/IS/277	277	113	0.88	No	IS	0
	4	F32T8	Kingtec	432K-277	277	115	0.87	Yes	IS	50
	4	F32T8	Magnetek/Triad	B432I277HP	277	112	0.88	Yes	IS	50
	4	F32T8	Magnetek/Triad	B432I277L	277	100	0.78*	No	IS	50
	4	F32T8	Magnetek/Triad	B432I277RH	277	113	0.89	Yes	IS	50
	4	F32T8	Magnetek/Triad	B432R277HP	277	125	0.90	Yes	Par-RS	50
	4	F32T8	Motorola	M4-IN-T8-277	277	110	0.88	No	IS	0
	4	F32T8	Motorola	M4-IN-T8-GP-A-277	277	111	0.87	No	IS	0
	4	F32T8	Motorola	M4-RL-T8-1LL-277	277	103	0.76*	No	RS	50
	4	F32T8	Motorola	M4-RN-T8-1LL-277	277	115	0.87	No	RS	50
New>	4	F32T8	Osram/Sylvania	QT-4x32/277HD10	277	114	0.89	No	IS	0
	4	F32T8	Osram/Sylvania	QT-4x32/277IS	277	114	0.89	No	IS	0
	4	F32T8	Osram/Sylvania	QT-4x32/277LP	277	100	0.77*	No	IS	0
New>	4	F32T8	Philips	SSB2-277-4/32 IS LH	277	114	0.87	No	IS	32
New>	4	F32T8	Philips	SSB2-277-4/32 IS LH	277	99	0.76*	No	IS	50
	4	F32T8	Robertson	RER4LT8-277	277	116	0.86	No	RS	50
New>	4	F32T8	Techmedia	432 T 277I	277	110	0.85	No	IS	50

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	4 F32T8	Toshiba	FMB32IS-277	277	106	0.85	No	IS	50
	4 F32T8	Toshiba	FMB32RP4-277	277	119	0.86	No	Par-RS	50
New>	4 F32T8	Toshiba	T432277A	277	114	0.87	No	IS	50
New>	4 F32T8	Techmedia	432 T 347I	347	114	0.86	No	IS	50
New>	4 F32T8	Techmedia	432 T 347I 75%	347	98	0.74*	No	IS	50

Dimming Ballasts

	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	1 F32T8	Advance	RDC-132-TP	120	30	0.86	No	Dim	50
	1 F32T8	Advance	RDC-1S40-TP	120	41	1.14	No	Dim	50
	1 F32T8	Lutron	FDB-4827-120-1	120	35	0.93	No	Dim	50
New>	1 F32T8	Philips	ECD-120-1/32 T	120	35	0.96	No	Dim	
New>	1 F32T8	Philips	ECD-120-1/32 ZT	120	32	0.86	No	Dim	
	1 FT40T5	Advance	RDC-132-TP	120	36	0.86	No	Dim	50
	1 FT40T5	Lutron	FDB-2227-120-1	120	36	0.82*	No	Dim	50
	1 F32T8	Lutron	FDB-4827-277-1	277	37	0.88	No	Dim	50
New>	1 F32T8	Philips	ECD-277-1/32 T	277	36	0.96	No	Dim	
New>	1 F32T8	Philips	ECD-277-1/32 ZT	277	32	0.86	No	Dim	
	1 FT40T5	Lutron	FDB-2227-277-1	277	37	0.82*	No	Dim	50
	1 FT40T5	Lutron	OSPCU-2227-277-1	277	48	0.99	No	Dim	50
	2 F25T8	Advance	RDC-2S32-TP	120	46	0.84*	No	Dim	50
	2 F25T8	Motorola	M2-RN-T8-10C-120	120	47	0.86	No	Dim	50
	2 F32T8	Advance	RDC-2S32-TP	120	64	0.85	Yes	Dim	50
	2 F32T8	Advance	RDC-2S40-TP	120	79	1.09	No	Dim	50
New>	2 F32T8	ELI	D232.C120	120	61	0.86	No	Dim	50
	2 F32T8	Lutron	ECO-T832-120-2	120	68	0.91	No	Dim	50
	2 F32T8	Lutron	FDB-4827-120-2	120	66	0.91	No	Dim	50
	2 F32T8	Motorola	M2-RN-T8-10C-120	120	63	0.86	No	Dim	50
New>	2 F32T8	Philips	ECD-120-2/32 T	120	71	0.98	No	Dim	
New>	2 F32T8	Philips	ECD-120-2/32 ZT	120	63	0.87	No	Dim	
	2 F32T8	Stocker & Yale	SY12DT8DW	120	67	0.95	No	Dim	50
	2 FT39T5	Lutron	FDB-1643-120-2	120	68	0.81*	No	Dim	50
	2 FT40T5	Advance	RDC-2BS40-TP	120	73	0.88	No	Dim	50
	2 FT40T5	Lutron	ECO-T540-120-2	120	68	0.82*	No	Dim	50
	2 FT40T5	Lutron	FDB-2227-120-2	120	68	0.80*	No	Dim	50
	2 F25T8	Advance	VDC-2S32-TP	277	46	0.86	No	Dim	50
	2 F25T8	Motorola	M2-RN-T8-10C-277	277	48	0.86	No	Dim	50
	2 F32T8	Advance	VDC-2S32-TP	277	61	0.87	No	Dim	50
	2 F32T8	Advance	VDC-2S40-TP	277	69	1.00	No	Dim	50
	2 F32T8	ELI	D232-C277	277	60	0.87	No	Dim	50
	2 F32T8	Lutron	ECO-T832-277-2	277	68	0.93	No	Dim	50

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	Lamp	Manufacturer	Catalog	Volts	Watts	BF	CBM	Starting	Temp
	2 F32T8	Lutron	FDB-4827-277-2	277	69	0.94	No	Dim	50
	2 F32T8	Lutron	OSPCU-4827-277-2	277	75	1.01	No	Dim	50
	2 F32T8	Motorola	M2-RN-T8-10C-277	277	65	0.86	No	Dim	50
New>	2 F32T8	Philips	ECD-277-2/32 T	277	69	0.96	No	Dim	
New>	2 F32T8	Philips	ECD-277-2/32 ZT	277	62	0.85	No	Dim	
	2 F32T8	Stocker & Yale	SY27DT8DW	277	68	0.98	No	Dim	50
	2 FT39T5	Lutron	OSPCU-1643-277-2	277	87	0.97	No	Dim	50
	2 FT40T5	Advance	VDC-2BS40-TP	277	73	0.88	No	Dim	50
	2 FT40T5	Advance	VDC-2S32-TP	277	75	0.87	No	Dim	50
	2 FT40T5	Lutron	FDB-2227-277-2	277	71	0.82*	No	Dim	50
	2 FT40T5	Lutron	OSPCU-2227-277-2	277	86	0.95	No	Dim	50
	3 F25T8	Advance	RDC-3S32-TP	120	69	0.86	No	Dim	50
	3 F32T8	Advance	RDC-3S32-TP	120	95	0.88	No	Dim	50
	3 F32T8	Lutron	ECO-T832-120-3	120	96	0.88	No	Dim	50
	3 F32T8	Lutron	FDB-4827-120-3	120	96	0.87	No	Dim	50
New>	3 F32T8	Philips	ECD-120-3/32 T	120	104	0.99	No	Dim	
New>	3 F32T8	Philips	ECD-120-3/32 ZT	120	89	0.82*	No	Dim	
	3 FT39T5	Lutron	FDB-1643-120-3	120	101	0.80*	No	Dim	50
	3 FT40T5	Lutron	ECO-T540-120-3	120	102	0.81*	No	Dim	50
	3 FT40T5	Lutron	FDB-2227-120-3	120	102	0.81*	No	Dim	50
	3 F32T8	Advance	VDC-3S32-TP	277	94	0.86	No	Dim	50
	3 F32T8	Lutron	FDB-4827-277-3	277	99	0.93	No	Dim	50
New>	3 F32T8	Philips	ECD-277-3/32 T	277	104	0.97	No	Dim	
New>	3 F32T8	Philips	ECD-277-3/32 ZT	277	94	0.87	No	Dim	
	3 FT40T5	Lutron	FDB-2227-277-3	277	103	0.82*	No	Dim	50

Notes:

*Electronic ballasts with a ballast factor (BF) less than 0.85, do not meet ANSI C82.11-1993 standards for full light output ballasts. These ballasts are listed here and are designated with an * after the ballast factor.*

CBM designation represents ballasts that meet ANSI C82.11-1993 standards and have been CBM Certified.

Starting/Temp columns represent the starting type, IN for Instant Start, Par-RS for Parallel-wired Rapid Start, and RS for Rapid Start. Starting temperature is the ballast manufacturers minimum starting temperature. This is for informational purpose, check with manufacturer for complete details.

Follow all manufacturers recommendations when choosing and installing a ballast.

FBO31T8 lamps may be substituted for F32T8 lamps.